# Implementing California's Solid Waste Collection Vehicle Regulation

## Reducing Diesel Particulate Matter (PM) Emissions From Waste Collection Vehicles

**California Air Resources Board**

**July - August 2004**

# Why Reduce Diesel PM?

- Diesel PM is a toxic air contaminant
- Increases Risk of Lung Cancer
- Aggravates Asthma & Chronic Respiratory Symptoms
- Irritates Eyes, Nose, and Lungs
- Contributes to Premature Death in Those with Heart and Lung Diseases

# Annual Health Impacts of Diesel PM In California

- Annual health impacts
  - 2,900 premature deaths
  - 3,600 hospital admissions
  - 240,000 asthma attacks/respiratory symptoms
  - 600,000 lost days of work
- By comparison
  - 3,700 deaths from car accidents
  - 2,000 homicides

# Diesel Risk Reduction Plan

- Adopted in 2000
- Goal is reducing diesel PM by 75% by 2010 and 85% by 2020.

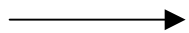
Strategies For PM Reduction:

- New Diesel Engine Standards
- Low Sulfur Diesel Fuel
- Ensure In-Use Compliance
- In-Use Controls For Existing Engines

# Implementation Status

## Diesel Risk Reduction Plan

- New Diesel Engine Standards
  - On-Road -- Adopted
  - Off-Road -- EPA Adopted
    - ARB December Board Hearing
- Cleaner Low Sulfur Diesel Fuel -- Adopted
- Ensure In-Use Compliance
  - Recall Testing -- Agreement Reached
  - Engine Manufacturer Diagnostics -- Adopted
  - Diesel On-Board Diagnostics -- Planned 2005
- In Use Controls for Existing Engines



# In Use Controls: Adopted

- Fleet Rule for Transit Agencies - Adopted 2000, Amended 2002 & 2004
- Emission Control Verification Procedures -- Adopted 2002
- School Bus Idling Restrictions -- Adopted 2002
- Solid Waste Collection Vehicles -- Adopted 2003
- Stationary Engines -- Adopted 2004
- Portable Engines -- Adopted 2004
- Transport Refrigeration Units -- Adopted 2004
- HD In-Use Idling Restrictions -- Adopted 2004

# In Use Controls: In Development

- On-Road Public and Utility Fleets
- Transit Fleet Vehicles (Not Urban Buses)
- Off-Road Equipment Public & Private
- Cargo Handling Equipment At Ports & Transportation Facilities
- On-Road Private Vehicles
- Harbor Craft
- Ocean Vessels

# Why Reduce In-use Diesel PM Emissions?

- Diesel Engines are Long Lived
- In-use Reductions Provide Near-Term Health Benefits
- Control Technology is Available Now
- New Engine Standards Offer Future Benefits

# Why Waste Collection Vehicles?

- Approximately 13,000 Diesel-fueled Collection Vehicles in California
- Multiple Trips on Waste Collection Days
- Significant Neighborhood Health Impact from Collection Vehicle Diesel PM

# Scope & Applicability

- Applies to Private Companies Collecting Solid Waste for a Fee
- Municipalities Operating SWCVs

**What Vehicles?**

- 1960 - 2006 MY Diesel Engines
- Greater than 14,000 lbs. GVWR
- On-Road Residential and Commercial SWCVs
- Back-up Vehicles (1,000 miles or less annually) are Excluded

# Municipality Responsibilities

- Report Annually by Jan. 31 2005--2013
- List of Waste Collection Contractors As of Jan. 1
- Contractor Information
- Municipality Information
- Include New Language in Contracts
  - Contract Date of December 31, 2004 or later
  - Must Require Contractor to be in Compliance with All Applicable Air Pollution Control Laws

# SWCV Rule Elements

## Owners Must:

- Apply BACT To Each Engine
- Follow Specific Implementation Schedule
- Keep Records For Each Vehicle

# Must Use Best Available Control Technology (BACT)

- Multiple BACT Options Exist
- One BACT Does Not Work for All Engines or Vehicles
- Acceptable Diesel Emission Control Strategy Brings Greatest PM Reduction, May Not Be Lowest Cost Strategy

# BACT Options

- Diesel Engines:
  - Certified to MY 2007 0.01 g/bhp-hr PM standard
  - Existing 0.10 g/bhp-hr PM standard retrofitted with Diesel Emission Control Strategy (DECS)
- Apply DECS to existing engines
  - Verified to Highest Diesel PM Emission Reduction
- Alternative-Fuel Engines (CNG, LNG, etc)

# DECS Verification Levels

- Level 1
  - 25% or greater PM reduction
- Level 2
  - 50% or greater
- Level 3
  - 85% or greater or $\leq$ 0.01 g/bhp-hr

- Optional NOx Reduction, 15% min.

# Current Verifications*

- Level 3 PM only
  - Clean Air Partners (dual fuel on-road)
  - Donaldson DPM (on-road)
  - Johnson Matthey (on-road)
  - Lubrizol ECS Purifilter (on-road)
- Level 3 with 25% NOx Reduction
  - Cleaire Longview (on-road)

*as of August 12, 2004

# Current Verifications*

- Level 2 PM with 15% NOx Reduction
  - Lubrizol's PuriNOx (on-road)
    - Emulsified Diesel Fuel

- Level 1 PM Only
  - Donaldson DOC + Spiracle (on- & off-road)
  - Donaldson DOC + Spiracle + ULSD (on-road)
  - Donaldson DOC + ULSD (on-road)

*as of August 12, 2004

# Implementation Schedule

:

**TOTAL FLEET 4 or More Vehicles**

| Group | Engine MY | BACT Implementation Deadline 12/31 | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | **2004** | **2005** | **2006** | **2007** | **2008** | **2009** | **2010** |
| 1 | 1988-2002 | 10% | 25% | 50% | **100%** | | | |
| 2a* | 1960 – 1987 (15 or more in the total fleet) | | 15% | 40% | 60% | 80% | **100%** | |
| 2b | 1960 – 1987 (4 to 14 in the total fleet) | | | | 25% | 50% | 75% | **100%** |
| 3 | 2003 – 2006 | | | | | | 50% | **100%** |

✶ Group 2a: An owner may not use Level 1 technology as best available control technology on Group 2a engines or collection vehicles.

# Implementation Schedule (Continued)

- For Very Small Fleets -- 1 to 3 Vehicles:
  - Group 1 (1988-2000) Implement by 2007
  - Group 2 (1960-1987) Implement by 2010
  - Group 3 (2003-2006) Implement by 2010

# Early Compliance

- Early Compliance Available for Group 1, 2a and 2b Vehicles
- Must State Intent in Letter to Executive Officer by Compliance Deadline
- Comply With 50% of Your Entire CA Fleet
- Allows Postponing Final Compliance for the Remaining 50% of Trucks
- Postpone by Two Years for Group 1, and One Year for Group 2a and 2b Trucks

# Early Compliance Schedule

| Groups | Schedule Details | Postponement |
|---|---|---|
| Group 1 1988-2002 engines | 50% or more by July 1, 2005. **At least half of the 50% must be oldest Group 1 engines.** | Postpone remaining Grp.1 to Dec. 31, 2009 |
| Group 2a 1960-1987 engines Fleets of 15 or more | 50% or more by Dec. 31, 2005 | Postpone remaining Grp. 2a to Dec. 31, 2010 |
| Group 2b 1960-1987 engines fleets of 14 or less | 50% or more by Dec. 31, 2006. | Postpone remaining Grp. 2b to Dec. 31, 2011. |

# Extensions For No Available Control Strategy

- Executive Officer (EO) May Issue:
  - Blanket

    Or
  - Owner-Requested
- Time Limits On All Extensions
- Must Apply DECS To All Eligible Engines Before Getting Extension

# EO Issued Blanket Compliance Extensions

| Groups | Issued annually March 1 | Year Of Final Compliance by December 31 |
|---|---|---|
| Group 1 1988-02 | Through 2007 | 2008 |
| Group 2a 1960-87 Fleets of 15 or more | Through 2008 | 2009 |
| Group 2b 1960-87 Fleets of 14 or less | Through 2010 | 2011 |
| Group 3 2003-2006 & Dual-fuel/Bi-fuel vehicles | Through 2010 | 2011 |

# Owner Requested Extension

Owner may request an extension if there are one or more trucks for which no ARB verified PM reduction strategy exists.

| **Groups** | **Yearly Application To EO By July 31** | **Year Of Final December 31 Compliance Deadline** |
|---|---|---|
| Group 1 1988-02 | 2004 Through 2007 | 2008 |
| Group 2a 1960-87 Fleets of 15 or more | 2005 Through 2008 One Exten. Per Engine | 2009 |
| Group 2b 1960-87 Fleets of 14 or less | 2007 Through 2010 One Exten. Per Engine | 2011 |
| Group 3 2003-2006 & Dual-fuel/Bi-fuel | 2009 Through 2010 | 2011 |

# Retiring A Vehicle?

- If to be Retired Within One Year Of Compliance Date,
- Then, Exempt From BACT
- Label Vehicle With Retirement Date
- Keep Records Verifying Retirement On Schedule
- Can Use As Backup Vehicle Or Sell Outside California.

# Low Mileage Backup Vehicle?

- If Collection Vehicle is Driven Less Than 1000 Miles Annually,
- Then, Exempt From BACT
- Must Be Labeled As Backup Vehicle
- Keep Records to Document Annual Mileage

# Want to Demonstrate New Technology?

- 10% Of Fleet Or 20 Vehicles (Whichever Is Less)
- Experimental Permit & Test Plan
- Run For Up To Two Years
- Vehicles Must Comply With BACT Six Months After Project Ends
- No Projects After Dec. 31, 2010
- Label and Keep Records

# SWCV Owner Record Keeping

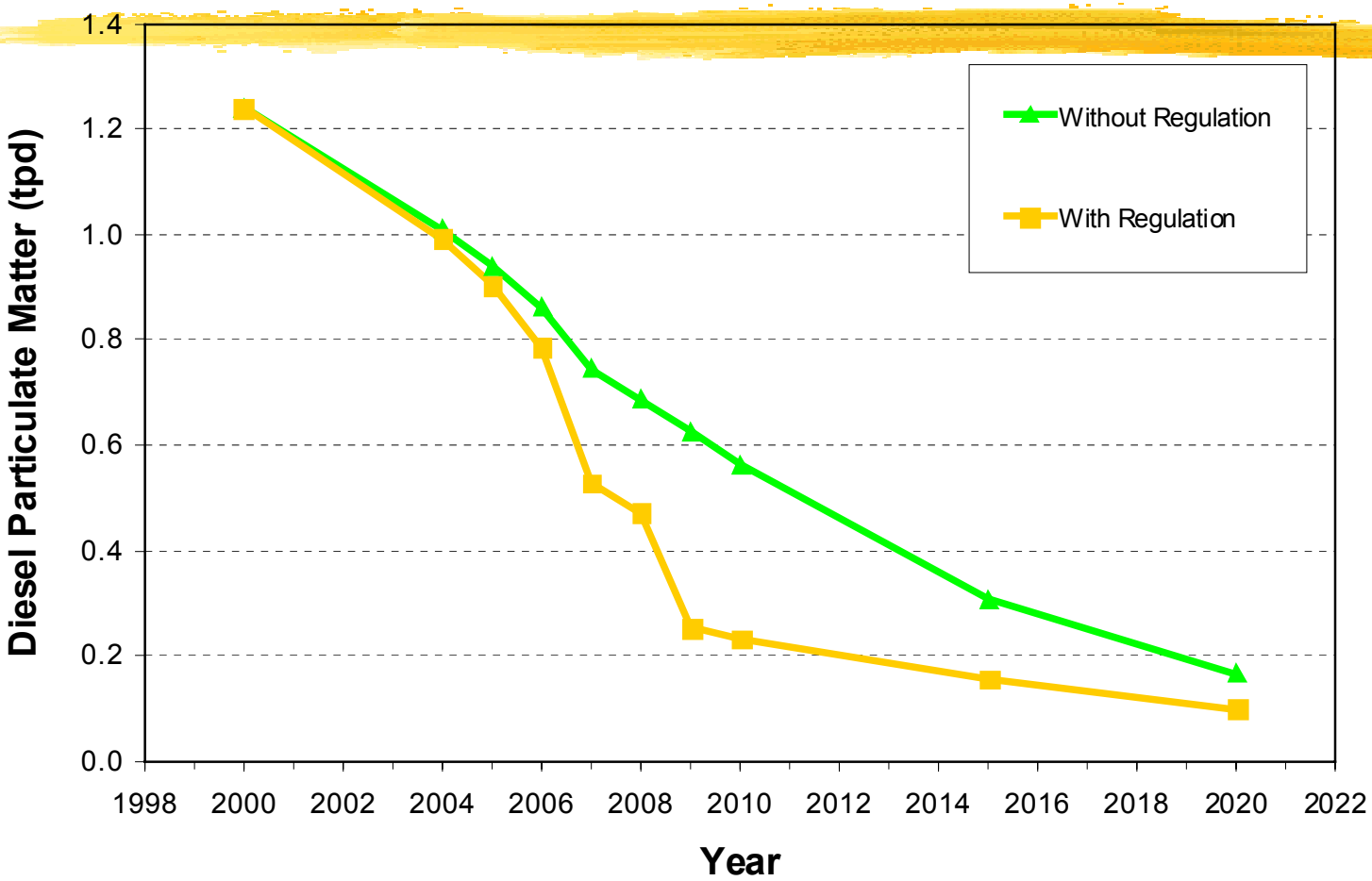
- Records Must Be Accessible to ARB Agents or Employees
- Some Records to Be Kept at Terminals
- Some Records to Be Kept in Trucks
- Trucks Must Have Labels With DECS Information
- See the Regulation for Details on Record-keeping

# Truck Labeling Requirements

## Each Truck Needs a Label By 12/31/04

- On Driver Door Jamb Or Other Accessible Place
- Must Have Engine Model Year And/Or:
  - Name of Contracted Municipality
  - Title 13 Info. on Installed DECS & Installation Date
  - Planned Compliance Date
  - Backup Vehicle Designation & Jan. 1 Mileage
  - Retirement Date, If Plan To Retire
  - Beginning & End Date Of Test Plan For Demonstration Projects

# Benefits: Diesel PM Reductions




**Average diesel PM reduction from 2000 baseline**

**by 2010 81%, by 2015 86%, by 2020 92%**

# Benefits in 2020

- Prevents 80 premature deaths at $900,000 per premature death prevented
- Reduces cancer risk
- Eliminates 2,260,000 pounds PM
- Eliminates 30,600 tons NOx + HC
- Average Cost per household $1/yr

# For More Information

- Solid Waste Collection Vehicle Rule
  - www.arb.ca.gov/msprog/swcv/swcv.htm
- Dr. Nancy Steele, Manager, In-Use Rules
    - (626) 350-6598 or nsteele@arb.ca.gov
- Richard Varenchik, Outreach
    - (626) 575 6730 or rvarench@arb.ca.gov
- Shawn Daley, Implementation Progress
    - (626) 450-6169 or sdaley@arb.ca.gov
- Verified DECS Lists
  - www.arb.ca.gov/diesel/verdev/verdev.htm